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USSR: Rebound in Production of Livestock Products

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An Intelligence Assessment

SOV 83-10188
October 1983

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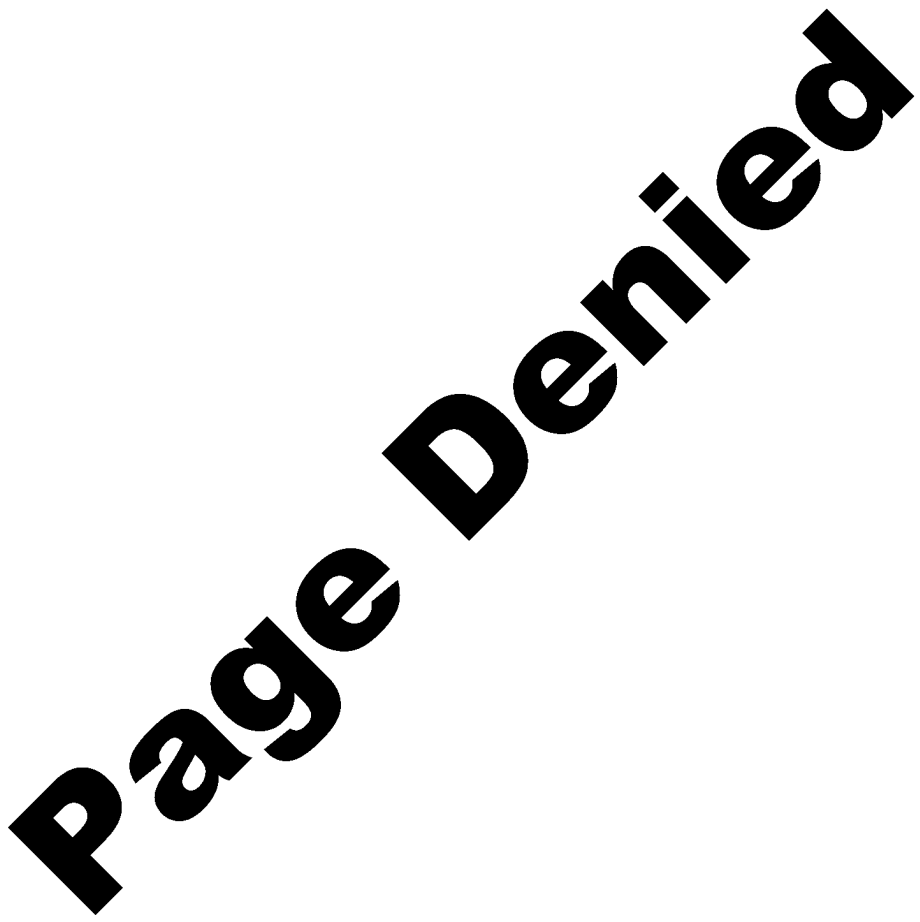

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USSR: Rebound in Production of Livestock Products

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An Intelligence Assessment

This paper was prepared by of the Office of Soviet Analysis. Comments and queries are welcome and may be addressed to the Chief, Soviet Economy Division, SOVA,

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Preface

This report [redacted] analyzes the unexpectedly good performance registered by the USSR's livestock sector in the 1982/83 crop year. It highlights a number of factors—missing data, unusual weather conditions, limited knowledge of changes in feeding practices, the size of the grain crop—that restrict our ability to estimate the USSR's need for Western grain in any year. [redacted]

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USSR: Rebound in Production of Livestock Products

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Key Judgments

Information available as of 1 September 1983 was used in this report.

Soviet production of livestock products during the first eight months of 1983 demonstrated a surprising resiliency in the aftermath of four successive disappointing grain crops and a downturn in grain imports in 1982. The largest grain crop in five years is expected this year and overall feed supplies are less strained as a consequence of an unusually mild winter, an early spring, and some improvement in the composition of the feed ration: Moscow's gamble on maintaining herds at the cost of reduced productivity (less meat per animal or milk per cow) appears to be paying off. Herds are at record levels, and the stage is set for substantial growth in meat production after four years (1979-82) of stagnation.

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Despite our earlier projected shortfall of 65 million tons in grain availability relative to estimated requirements in the 1982/83 crop year (July 1982–June 1983), Moscow imported only 35 million tons. Moreover, although planned meat and milk production was not achieved, the USSR was able to maintain meat production in 1982 at the 1981 level, to increase milk production by nearly 2 percent, and to expand livestock herds slightly. Further production gains were registered in the first eight months of 1983.

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The USSR needed substantially less grain because:

- A record harvest of forage crops added the equivalent of roughly 9 million tons of grain.
- An unusually warm winter reduced the need for feed by an estimated 17 million tons of grain.
- Increased availability of high-protein feeds such as oilseed meal reduced the need for grain by an estimated 5 million tons.

Together, these developments are sufficient to explain the USSR's success in the production of livestock products. In addition, the 1982 grain crop may have been at the higher end of the range—178 million tons—associated with our 165-million-ton point estimate of the grain crop.

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The trend toward increased reliance on forage crops and the improvements in feeding efficiency resulting from use of high-protein feeds and supplements are likely to reverse the rise in the share of grain in the livestock feed ration—a trend that has been apparent over the past two decades.

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These developments as well as uncertainty as to how the leadership will balance its desire to reduce dependence on Western grain against its commitment to the livestock product goals of the Food Program will prevent precise forecasts of Soviet grain imports in the next several years. Projections will have to be made in the form of forecasts reflecting the uncertainties surrounding Soviet policy, technical progress, and estimates of productivity based on feed use. Import projections for any given year, in turn, must take into account winter and spring weather conditions and their impact on the demand for grain. 25X1

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USSR: Rebound in Production of Livestock Products

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Introduction

Moscow's overall need for grain is determined in large part by the increasing need for grain for livestock feed. In years of poor grain harvests—especially after the poor crops of 1979-82—the regime has resorted to massive grain imports to support the livestock sector (see table 1). Forecasting the quantities of grain to be imported, however, is subject to numerous uncertainties.

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Our ability to understand the linkages between feed use—grain, forage, nongrain concentrates—and actual livestock product output is significantly constrained by the paucity of published data. This makes it difficult to assess the likely impact of specific Soviet policy initiatives in the agricultural sector as well as the impact of individual crop harvests on meat production. Estimating Moscow's grain imports is made doubly difficult by our lack of understanding of Soviet policies regarding the nation's grain stocks and—since 1980—the withholding of official grain production statistics.

The USSR's success in maintaining livestock herds while keeping up livestock product output in recent years has been puzzling given our projections of Soviet grain harvests, the levels of imported grain, and our understanding of the grain balance. Last year, in particular, our initial estimate of Moscow's need for imported grain turned out to be far too high. This paper, by reviewing the factors that allowed Moscow to produce more with less imported grain than we expected, highlights the uncertainties associated with our ability to project livestock product output and the level of grain imports from the West.

Trends in Output of Livestock Products

The program to increase supplies of meat has been a centerpiece of Soviet consumer policy since 1965. With good weather and successful grain crops, the commitment to improve the diet was met during the late 1960s and early 1970s. In 1975, unusually poor weather caused a grain crop failure. In that year the USSR responded to a sharp drop in grain production, from 196 million tons in 1974 to 140 million tons in 1975, by importing record quantities of grain and by reducing herds drastically. Smaller herds led to a marked drop in meat output in 1976 (see table 1). Not until 1978 did meat output again reach trend levels.

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Soviet meat output stagnated from 1979 through the first half of 1982, largely as a result of four poor-to-mediocre grain crops. By importing large quantities of grain and meat, the Brezhnev leadership was able to maintain per capita meat consumption at a fairly steady level. It also managed to keep herds largely

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Table 1
USSR: Production of Livestock Products

	Meat *(million tons)*	Milk *(million tons)*	Eggs *(billions)*
1965	10.0	72.6	29.1
1970	12.3	83.0	40.7
1975	15.0	90.8	57.4
1976	13.6	89.7	56.2
1977	14.7	94.9	61.2
1978	15.5	94.7	64.5
1979	15.3	93.2	65.8
1980	15.1	90.9	67.9
1981	15.2	88.9	70.9
1982	15.2	90.1	72.1
1983 [a]	16.1	97.0	76.4

[a] Estimate based on eight-month cumulative production on state and collective farms.

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intact—although at the cost of declining animal productivity as reflected in reduced slaughter weights and less milk per cow. By the end of 1981, the latest year for which we have complete statistics, average slaughter weights for cattle were down 4½ percent from the 1978 level, and hog slaughter weights were down nearly 5 percent. Milk yields had dropped by roughly 7½ percent. Milk and meat production, however, held up during 1982 better than we had predicted on the basis of (a) our estimates of the 1982 grain crop and (b) a comparison of calculated Soviet requirements for imported grain with actual grain imports. This trend has continued into 1983. In addition, the emphasis on concentrating poultry and egg production in large industrial units and giving this sector priority with respect to feed supplies brought continued growth in output of both eggs and poultry meat.

This shift in emphasis—from distress slaughter to herd maintenance—supports other evidence of increasing Soviet commitment to improving the diet of the population, in particular by providing more meat. The leadership had recognized that after unusually high slaughter rates boosted meat output in 1975, production dropped by nearly 10 percent in 1976. Three years were required to rebuild herds and increase meat production to trend levels. During this period Brezhnev was developing the administrative and political support for his Food Program and undoubtedly was loath to set back the Soviet livestock program by reducing herd numbers. It was a gamble—disease or bad weather could have killed large numbers of animals weakened by reduced feed rations—but one that paid off.

Last fall production of meat and milk on state and collective farms—which produce roughly two-thirds of total meat and three-quarters of total eggs—began to climb above the trend based on performance from 1978 through first-half 1982. Output held up during the winter despite some decline in slaughter weights, and farms continued to build herds. During the spring of 1983, meat production climbed to 7 percent above the level for the comparable period in 1982. Milk production was up 12 percent.

On a seasonally adjusted basis, monthly production of meat through August of this year was running well above trend, in marked contrast to the early 1982 pattern (see figure 1). During the 1978-82 period, meat production on state and collective farms had declined at an average annual rate of 0.5 percent. Beef and pork production followed a similar pattern, although pork output was somewhat more erratic from month to month. The 1978-82 average annual rates of change in production of beef and pork were −1.6 and −1.2 percent, respectively. In contrast, production of poultry meat grew by 8.7 percent annually during 1978-82. After demonstrating strong growth in the first quarter of 1983, monthly output of poultry meat was below trend in June, July, and August.

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Milk production on state and collective farms picked up early in the spring of 1982. In May 1983 it was nearly 17 percent above trend, but it slowed to about 10 percent above trend in June, July, and August. The improved performance in 1982, following a four-year decline in total milk production, boosted milk output by almost 2 percent over the 1981 level.

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The 1983 midyear plan-fulfillment report indicated continued growth in herd numbers. Increases of nearly 5 percent in hog numbers and 1.5 percent in cattle numbers suggest strongly that meat production will continue to trend upward. The reported 2-percent increase in poultry numbers was unusually low, however. It could signify that flocks are close to desired levels and that further large above-trend increases in poultry meat production are not expected.

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Factors Underlying the Resurgence

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Based on our understanding of Soviet feeding efficiencies, in mid-1982 we estimated that Moscow would need to import at least 65 million tons of grain during the July 1982/June 1983 crop year if the grain crop were 165 million tons and if planned production of meat, milk, and eggs were to be achieved.[1] Because the USSR's port and internal distribution system was

[1] In this paper estimates of grain imports are based on the crop year (July/June) rather than the calendar year because our grain balance technique—supply versus usage—assumes the grain crop will be used to meet needs over the stated 12-month period.

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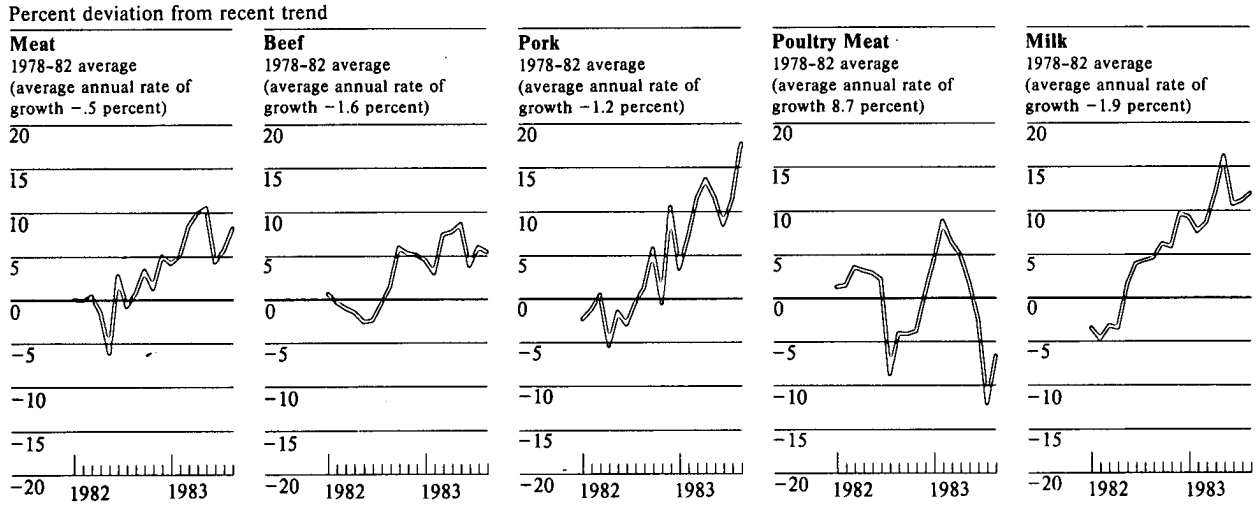
Figure 1
USSR: Monthly Production of Livestock Products[a]



[a] The USSR publishes data for only the first 11 months of any year.

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not expected to be able to handle more than 50 million tons of imported grain, fairly evenly distributed throughout the year,[2] we estimated that Moscow would be forced to:

- Slaughter animals at above-normal rates as was done in 1975 when overall herds were cut by about 3 percent.
- Stretch already short feed rations still more and thus force output of meat, milk, and eggs below the 1981 level.
- Reduce the quantity of grain used for food and industrial purposes. (This would not have meant less bread but rather a reduction in its quality—less white bread from finely milled grain, more dark bread from more coarsely milled grain.)

None of these actions proved to be necessary. In fact, the USSR achieved gains in some areas while importing only half as much grain as we thought it needed. Although the USSR did fall somewhat short of planned targets for meat production, output was roughly equal to 1981 levels. Allowing for the 5- to 6-million-ton drop in grain demand associated with below-plan meat and milk production, our conventional grain balance—linking grain production, imports, and use—indicated a 15-million-ton drawdown in Soviet grain stocks. At a time when Moscow could have afforded to buy larger quantities of grain and prices were comparatively low because of ample world supplies, the failure to purchase more grain was perplexing.

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In retrospect, the Soviet Union was able to achieve these gains in the production of livestock products *without* drawing down grain stocks; in fact stocks conceivably could have increased if last year's harvest

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was much above our estimated level. The following sections discuss the factors that seem to explain why the Soviets did better than we expected—above-normal forage crops; favorable weather; larger supplies of high-protein feeds; the continuing shift to production of meat, milk, and eggs in centralized facilities; the contribution of the private sector; and a possible underestimate of the 1982 grain crop. The uncertainties in our estimates of requirements for grain are also reviewed.

Another Look at Feed Supplies

Livestock feed comprises concentrates (feeds with high nutritive content such as grain and oilseed meals) and roughages (feeds with high cellulose and water content such as hay, silage, and potatoes and other feed roots). Roughages can be further disaggregated into those that are harvested—and thus can be measured—and pasture.

Grain. The use of grain for feed has increased by nearly 50 percent over the past decade. As a result, the USSR has been driven to import increasing quantities of grain as production has fallen far short of planned targets in seven of the past 10 years.

The growing requirements for grain are partly a result of larger inventories of livestock; the number of animals (in standard units) has grown by almost 10 percent over the past decade.[3] But the increasing share of grain in feed rations explains most of the growth. By 1980, according to Soviet data, grain constituted 30 percent of the ration compared with an average 25 percent during 1966-75. In some areas such as Estonia the share of grain has reportedly reached over 60 percent of the feed ration.

Lack of data on grain production and usage for 1981 and 1982 forces us to rely on a methodology based on a reconstruction of the Soviet grain balance in which total supply is balanced against total usage. On the production side, since July 1982, our best estimate of 1982 production has held firm at 165 million tons; for the four-year period for which we were able to compare our projections against official harvest data, our estimates were within 8 percent of the figures announced by the USSR. Subsequent reviews of the evidence available through this spring found no basis for changing this estimate. Even so, because of the uncertainties associated with our grain crop assessment for last year, we do not rule out a crop as high as 178 million tons.

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The USDA, which had estimated the 1982 grain crop at 170 million tons during the late summer and fall, revised its estimate upward to 180 million tons in November 1982. The revision was based on unofficial Soviet statements that the 1982 crop was larger than the 1981 crop and that the USDA estimate at 170 million tons was too low.

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There are other indications that our estimate for 1982 may be low:

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- In its January 1983 plan-fulfillment report, the Central Statistical Administration reported that the value of agricultural output in 1982 was 4 percent higher than in 1981.[4] No grain figure was announced, but production of other crops and livestock products was given. Our measure for 1982—incorporating all reported production statistics and a grain crop estimate of 165 million tons—indicates that *net* agricultural output grew by 3 percent. Recalculating our index on a gross basis in the 1973 comparable prices used by the CSA gives a growth rate of 2.7 percent, suggesting the 165-million-ton grain estimate understates the actual output, perhaps by 15 million tons. The 158-million-ton estimate for the 1981 grain crop fits well with the announced growth rate. It must be remembered, however, that the differences in product weights in the two indexes and in the measurement of feed used could also cause the disparity in growth rates.

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[3] "Standard animal unit" refers to equivalent units into which cattle (excluding cows), cows, hogs, poultry, sheep, and goats are converted by the use of weights based on relative feed requirements.

[4] This official Soviet index measures gross output of agriculture. The measure differs from the CIA measure in that products used for seed and crops fed are counted as output of the crop sector and feed is also implicitly included in the value of livestock production. Moreover, the Soviet measure includes a number of other minor products not counted in our measure. See JEC *USSR: Measures of Economic Growth and Development 1950-80*, Washington, DC, December 1982, pp. 258, 279-80.

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- A month later, in the only subsequent reference to the size of the grain crop, two reporters for the Soviet agricultural newspaper *Sel'skaya zhizn'* told the US agricultural counselor in Moscow that the 1982 crop was "a normal one . . . far better than Western estimates." The reporters were not able to define "normal."

On the usage side, estimates of grain used for food, seed, industrial purposes, and export are fairly reliable. These quantities do not fluctuate much from trend. Grain used for livestock feed is estimated according to Soviet coefficients representing grain required to produce meat and other livestock products as well as to support growth in livestock herds.[5]

The resulting implied stock change—supply less utilization—is a residual. The USSR considers grain a strategic good, and information on grain stocks is an official secret. Our estimate of the grain balance—assuming a crop of 165 million tons and the traditional relationship between grain use and livestock product output—of last fall suggested substantial drawdowns in stocks over the past few years (see table 2).

Roughages. A record forage harvest, however, probably reduced Moscow's need for grain for feed. In 1982 the supply of selected harvested roughages was 26 percent higher than the average level of the previous three years (see figure 2). Supplies of haylage and silage in particular were at record levels. No references to the total feed supplied in 1982 have been noted as yet, although the situation with respect to some types of feed improved dramatically. Ziya Nuriyev, head of the All Union Agro-Industrial Commission, said in February 1983 that state and collective farms had procured 16 million tons more of hay, silage, and other nongrain feeds (in terms of feed units or comparable nutritive value) in the fall of 1982 than in the same period in 1981.

The greatly improved picture for forage crops in 1982 was partly a result of good weather during October; the rate of harvesting picked up substantially compared with earlier years.[6] Increased procurements,

Table 2 *Million tons*
USSR: Change in Grain Stocks Implied by CIA Grain Balances

Year	Change
1976/77	+16.5
1977/78	−10.0
1978/79	+24.2
1979/80	−12.5
1980/81	−4.3
1981/82	−15.0
Cumulative change	**−1.1**

however, could also have reflected a strenuous push to reduce the quantities of grain and other concentrates being fed. Farm managers had been emphatically warned throughout 1982 not to count on the state to supply grain in the event of shortfalls in feed supplies.[7] In any event, during the 1982/83 winter much larger quantities of roughage were available.[8] Moreover, the

[5] The derived series tracks well for the 1970s when compared with the officially reported statistics on concentrates fed.

[6] In mid-1982 we had estimated—on the basis of the average historical relationship between total grain production and total nongrain feed availability—that the total supply of feed would be down 4 percent in calendar year 1982 as compared with 1981. Because we also implicitly assumed the share of grain in livestock feed rations remained constant, the drop in roughages was also 4 percent.

[7] For more than a decade, the USSR had stressed the need to increase the quantities of grain fed to livestock, both absolutely and as a share of the ration. Concentrates fed more than doubled during 1965-80, while feeding of harvested roughages increased by only 40 percent. Feed derived from pasture declined by 3 percent over the period. Beginning in 1980 a new note was sounded. The emphasis shifted to feeding less grain and making more effective use of forage crops. In 1981 warnings against counting on the state to make up feed shortfalls began to be heard. They increased in number and intensity during 1982.

[8] The increase was 14 percent more than for the winter of 1981/82 according to one authoritative source, 16 million tons of feed units according to another (*Planirovaniye i uchet*, No. 1, 1983, p. 4; and *Izvestiya*, 9 Feb 1983, p. 2). If the entire 16 million tons of feed units were used for beef production, other things being equal, some 800,000 to 900,000 additional tons of beef (slaughter weight) would have been produced.

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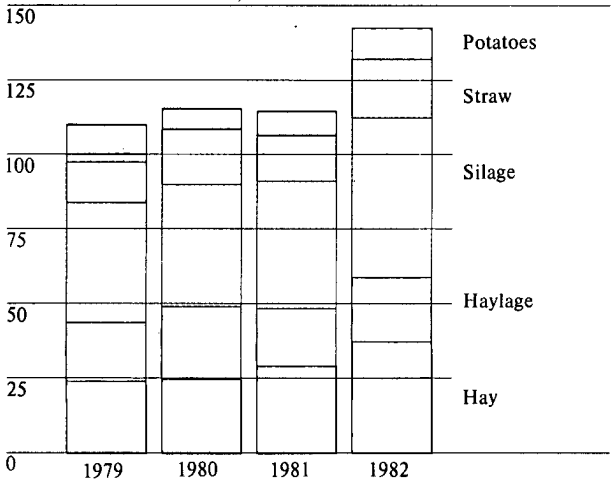
Figure 2
USSR: Cumulative Procurement of Selected Harvested Feeds



[a] The final week that procurement data are usually published, except for potatoes. That quantity is derived as a residual—production adjusted for trade less seed and less food use.

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favorable harvesting weather assured on average a higher quality forage crop and one less prone to loss in storage.[9]

[9] The value of forage crops is only as good as their initial quality and the success in maintaining that quality. Storage facilities are limited in the USSR, and losses as high as 40 percent have been cited in Soviet publications dealing with agricultural developments. I. Gorlanov of the Lenin All Union Academy of Agricultural Sciences noted in June of this year that annual storage losses for silage and haylage average 20 million tons and for hay, 6 million tons (*Sel'skaya zhizn'*, 26 June 1983, p. 2). This is equal to about 9 million tons of feed units, or roughly 10 percent of average procurement of these three crops in 1979-81. The effectiveness of the available roughages is further reduced because much of what is stored is of poor quality. In 1980, for example, only 29 percent of hay, 27.5 percent of haylage, and 46.9 percent of silage fed met standards for Classes I and II (*Ekonomika sel'skogo khozyaystvo*, No. 2, 1983, p. 27). Lower quality means less nutritive value per unit. Another source estimated that in 1980 over 16 million tons of feed units were lost because the quality of much of the harvested forage crops fell into Class III or lower (*Zhivotnovodstvo*, No. 6, 1981, p. 30).

This spring, temperatures averaged 4 degrees Celsius above normal. Spring field operations were under way two to three weeks earlier than usual, and animals moved into pasture well ahead of the usual schedule. By mid-May farms were already harvesting roughage crops, not only ensuring a good start on feed supplies for the coming year but adding to already available supplies. On 1 August this year, nearly a fourth more forage had been procured (in terms of feed units) than in the same period last year. Moreover, quality is again reportedly better; well over half the hay and haylage procured in the RSFSR is of first- or second-class quality. Some oblasts are reporting that as much as 92 percent of haylage procured is of first-class quality. 25X1

The increased availability of forage crops coupled with improved pasture conditions suggests that the share of concentrates in overall livestock rations dropped from 36 percent in 1981 to 35 percent in 1982, while that of grain dropped by about half a percentage point—from 30½ percent to 30 percent. If supplies of harvested forage were stored adequately through the winter, the share of grain fed could have been even less in the 1982/83 crop year—perhaps as low as 27½ percent. As a result, about 9 million tons of grain could have been saved. 25X1 25X1

Factors Raising Feeding Efficiency 25X1

In addition to greater-than-anticipated feed supplies, the Soviets were able to reduce grain demand further by improving feeding efficiency. Among the factors contributing to more efficient use of feed supplies have been a warmer-than-usual winter and larger supplies of high-protein feeds (soybean meal and single-cell protein in particular). The campaign to encourage private-sector production of livestock products seems on balance to have been unimportant.[10] 25X1

[10] The proliferation of large-scale specialized livestock production facilities, which improve feeding efficiency by as much as 50 percent according to Soviet agricultural specialists, was expected to play a role as well. Our analysis suggests, however, that grain savings resulting from production in these units were largely offset by lower efficiency in the remainder of the livestock economy connected with the priority given to these complexes. 25X1 25X1

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Weather. According to the National Oceanographic and Atmospheric Administration, temperatures in the USSR during the winter months December 1982–March 1983 averaged 4 degrees Celsius above normal, reducing the normal winter-summer differential by 15 to 18 percent. Warmer weather means that less feed is required per unit of product output.[11]

Soviet authorities report that feed consumption ranges from 19 to 68 percent higher per unit of output during the winter months than during the summer. Assuming the range represents mild-to-severe winters relative to cool-to-hot summers, and that product is evenly produced throughout the year, feeding requirements in the USSR are probably about 45 to 50 percent higher on average during December-March than during April-November. Distributing total annual feed requirements for the year according to the winter-summer need and reducing the derived winter 1982/83 feed requirement to account for the warmer weather—a highly simplified calculation at best—indicates that warmer weather could have reduced feed requirements for 1982/83 by perhaps 17 million tons of grain compared with the requirements for 1981/82.[12]

Supplies of High-Protein Feeds. The Soviet livestock feed ration is short of both calories and protein. Overall quantities of energy feed in the ration are about 20 percent below announced standards, and in 1980 the average feed ration contained 95 grams of digestible protein compared with the long-established norm of 105 to 110 grams (*Ekonomika sel'skogo khozyaystvo*, No. 2, 1981, p. 61). To eliminate the current protein deficit with soybean meal—a readily available high-protein feed—would have required almost 11 million tons of imports. Upgrading the protein content to the norm level would in turn reduce the calorie deficit to 5 percent or less.

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The USSR is making some progress toward reducing the protein deficit by encouraging the planting of high-protein crops such as peas and beans or alfalfa. More directly, the USSR is expanding the supply of high-protein feeds by importing more soybeans and soybean meal and by increasing the output of single-cell protein. In 1982, imports of soybeans were 50 percent higher than in 1980, while purchases of soybean meal nearly tripled. Production of single-cell protein appears to have resumed its upward trend after four years of stagnation during 1977-80, increasing by more than 10 percent to 1.04 million tons in 1981.[13]

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These increases, if incorporated completely into total feed supplies, would have been sufficient to raise the protein content per feed unit from 95 to 96 grams in 1982 or about 1 percent. This in turn would reduce the amount of grain needed for feed by as much as 5-6 million tons.

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Contribution of the Private Sector. Although the regime is uncomfortable with the idea of encouraging the private sector, individual farmers continue to contribute significantly to the Soviet Union's supply of livestock products, accounting for roughly one-fourth of milk output and 30 percent of meat and egg

[11] A unit of output—which in the USSR consists of a kilogram of either liveweight gain or milk or of 10 eggs—is the common measure of feed requirements. To support output, however, a share of the feed is required to maintain the animal, on average a third to a half of feed consumed. In colder weather an animal requires more feed or the share of feed going to maintenance increases, leaving less feed for product output.

[12] The "savings" could have been as much as 20 million tons of grain if the average winter-summer differential in temperature for the country as a whole falls at the low end of the temperature range. This is a rough calculation based on Soviet statements of countrywide averages for the given periods. Data are not available to correct for regional temperature variations, the distribution of livestock by area or by type, regional differences in facilities for housing animals, or for the many other factors that could affect the ratios. The general percentage differences, however, accord reasonably well with test data in the United States, which show, for example, that feed requirements are 25 percent less in July and 40 percent less in October than in December in some midwestern states.

[13] Single-cell protein (SCP) is a collective term including protein-rich microorganisms such as algae, yeast, molds, and other fungi grown either on byproducts of oil or on organic wastes from agriculture and industry. The USSR is by far the world's largest producer of SCP. Although comparatively small amounts are produced in the West, the cost of production—roughly double that for soybean meal—and fears of possible carcinogenic properties have effectively halted growth in output. Data for Soviet production in 1982 are not yet available; we assume production increased by another 10 percent.

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output last year. As in the past when agricultural output has fallen short of plan, the leadership once again is encouraging the private sector to increase production, particularly of meat. For example, a joint party-state decree published in January 1981 urged state and collective farms to supply the private sector with more feed and other needed inputs including young animals.

Despite the decree and a campaign urging more state help for individuals in marketing surplus meat and milk, total output in the private sector has stagnated or declined in recent years as the following tabulation shows. The slide in milk production mirrors the decline that had been occurring in state and collective farm milk production:

	Meat *(million tons)*	Milk *(million tons)*	Eggs *(billions)*
1980	4.7	27.1	21.3
1981	4.6	25.5	22.1
1982	4.6	23.9	22.0

The question of feeding efficiency in the private sector—Is it higher or lower than in the "socialized" sector? And has it been improving?—remains a puzzle. According to Soviet statistics, the value of livestock output in rubles per ton of feed units on state and collective farms is about three-fourths that of the private sector. This indicates either a high degree of feeding efficiency or an understatement of actual feeding by the private sector.[14]

[14] Because statistics on private-sector feeding are largely based on the family budget survey, some degree of understatement is likely. For example, anecdotal evidence indicates that substantial quantities of grain are stolen and used for feed. Individuals are not likely to report this source of feed. Similarly, although the budget survey questionnaire includes a space in which to report bread fed to livestock, in many areas this is illegal and thus not likely to be reported fully. We estimate that as much as 4 million tons of bread may be fed annually.
Soviet statements on feeding efficiency in the private sector are inconclusive—on the one hand claiming much lower efficiency in use of inputs because so much more labor is involved (*Ekonomika Sovetskoy Ukrainy*, No. 6, 1982, p. 32) and on the other hand claiming far less grain is needed because households use food scraps and byproducts of garden plots to a much greater degree than do state and collective farms (*Planovoye khozyaystvo*, No. 8, 1981, p. 96).

In any event, efficiency in the private sector was fairly steady in the late 1970s, peaked in 1980, declined slightly in 1981, then dropped sharply in 1982 as the value of privately held herds jumped by 5 percent on 1 January 1983 as compared with 1 January 1982. The relative stability of herd numbers and product output during 1979-82 does not suggest any marked improvement in feeding efficiencies. Possibly suggesting some growth in output, procurements of both meat and milk from the private sector on a monthly basis this year are running slightly ahead of the depressed 1982 level. They are still well below the 1981 level, the last year for which we have complete data.[15]

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Reconciliation of the Feeding Gap

To recapitulate, early last summer we estimated that the USSR—based on a 165-million-ton grain harvest—would need 65 million tons of additional grain in the July 1982/June 1983 crop year to maintain seed, food, and industrial use and to meet plan targets for meat, milk, and egg production. Because meat and milk production fell short of plan by roughly 5 percent, this gap was reduced to about 60 million tons, or 25 million tons more than actual imports.

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A number of factors probably combined to enable the Soviet Union to limit its grain imports:

- Increased supplies of forage crops—if properly stored—could have lowered the need for feed by as much as 9 million tons of grain.
- Warmer weather last winter may have saved another 17 million tons of grain.
- Increased supplies of high-protein feed could have cut feed requirements by 5-6 million tons of grain.
- The 1982 grain harvest may have been larger than our 165-million-ton estimate, increasing the supply of grain by as much as 12-13 million tons.

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[15] The falloff in 1982 may have resulted from individuals marketing through state and collective farms rather than directly to procurement agencies. Beginning in 1981 individuals were allowed to do this to obtain additional feed from farms. Farms, in turn, were helped in meeting plans for meat procurement.

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Together these potential savings are equivalent to about 45 million tons of grain, more than enough to cover the difference between projected requirements and imports:

	Million tons
Grain import needs for 1982/83 (as estimated in July 1982)	At least 65
Less shortfall from planned meat and milk output	60
Less imports	35
Equals the grain gap	At least 25
Filling the gap	
Increased harvest of roughages	9
Warmer weather	17
Increased supplies of high-protein feeds	5-6
Possibly larger grain crop	12-13
	43-45

Implications for Future Forecasts

A large portion of the savings in livestock feed in 1982/83, according to the calculations outlined above, resulted from an unusually warm winter, something that cannot be expected to recur in 1983/84. Nonetheless, larger harvests of forage crops also played an important role, as did soybean and soybean meal imports. Improvements in the protein balance as well as the emphasis on increasing the quantity and quality of harvested forage crops in order to reduce the share of grain in livestock feed rations can be expected to continue. We therefore expect that, weather aside, grain fed to livestock will increase more slowly relative to growth in output of livestock products than in the past.

As the USSR improves in feeding efficiency, and as we move further away from published statistics on grain production and usage, estimating grain imports—on the basis of a comparison between domestic grain production and planned livestock output—will become more difficult. In addition, previous predictions of Soviet grain imports have assumed a willingness to support (to an extent limited only by port and internal transport capabilities) the domestic livestock program with increasing quantities of foreign grain. The Soviet decision to scale back goals for livestock production and to buy less grain than it could have easily afforded in 1982/83 illustrates the importance of how the leadership weighs the conflicting goals of reducing dependence on Western grain—enunciated by Brezhnev in launching the Food Program—and of reaching ambitious targets in livestock products. 25X1

Last year's performance in forecasting grain use and import demand, therefore, has a number of implications for future forecasts and CIA research. In particular, Soviet success in expanding the quantity and quality of its forage crop along with increased use of feed supplements have reduced our confidence in the ability to predict future grain demand on the basis of past trends. How fast Soviet feeding efficiency improves will depend, in no small measure, on the leadership's commitment to the agricultural sector. 25X1 25X1

In view of the uncertainties summarized above, future forecasts of likely Soviet grain needs and import demand for a given year should probably be presented as a range of possibilities that becomes narrower as the crop year progresses:

- The substantial potential swing in domestic demand for grain resulting from winter and early spring weather conditions precludes a complete assessment of import needs even after the fall harvest is in.

- Leadership policies toward herd management and livestock product output goals become clearer as the year passes.

- Although the lower bounds of import demand are fixed by long-term agreements, in most cases imports in excess of the minimum levels will be determined by Soviet policy choices that pit the hard currency costs of additional imports and the aversion to becoming dependent on Western producers against the leadership's commitment to expand meat production and thereby improve the quality of the Soviet diet. 25X1 25X1

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Projections of grain purchases over the longer term must take into account the same kinds of uncertainties as short-term forecasts, but the range of uncertainty is necessarily greater. Imports will depend on success in raising the level of and reducing the variation in grain yields, success in improving the nutritional balance of the livestock ration, trends in forage crop yields, hard currency availability, policies toward grain stocks, and on the emphasis the leadership gives to a sharp upturn in meat supplies. The USSR has been willing to enter into a number of long-term grain agreements that define the bottom end of the range for predicted imports at a high level—roughly 20 million tons for the next two years. Fixing the upper end of the range requires an assessment of all of the factors that bear on the use of grain for livestock feed.

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